SELECTED LISTING OF TECHNOLOGY UTILIZATION PUBLICATIONS

(including all Tech Briefs through December 1965)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. February 1966

Foreword

The Administrator of the National Aeronautics and Space Administration has established a technology utilization program for "the rapid dissemination of information . . . on technological developments . . . which appear to be useful for general industrial application." From a variety of sources, including NASA Research Centers and NASA contractors, space-related technology is collected and screened, and that which has potential industrial use is made generally available. Information from the Nation's space program, including the latest developments in materials, processes, products, techniques, management systems, and analytical and design procedures, is thus disseminated to American industry.

This "Selected Listing of Technology Utilization Publications" provides a convenient guide to Special Publications of particular interest, and to all Tech Briefs, that NASA's Technology Utilization Division has published in implementing the mission described above.

THE DIRECTOR, *Technology Utilization Division*
National Aeronautics and Space Administration

Contents

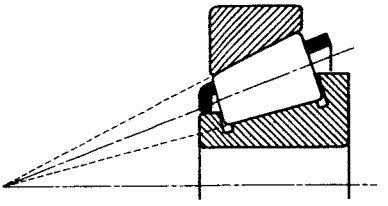
Selected Special Publications

The Special Publications of NASA's Technology Utilization Division help to implement its mission to disseminate rapidly all information on technological developments that appears to be useful for general industrial application. This group of Special Publications includes selected surveys of NASA contributions to entire areas of technology, as well as handbooks, reports, notes, conference proceedings, special studies, and selected bibliographies.

The Special Publications listed and described here may be ordered from—

Clearinghouse for Federal Scientific and Technical Information
Port Royal Road
Springfield, Virginia 22151

ADVANCED BEARING TECHNOLOGY
NASA SP–38

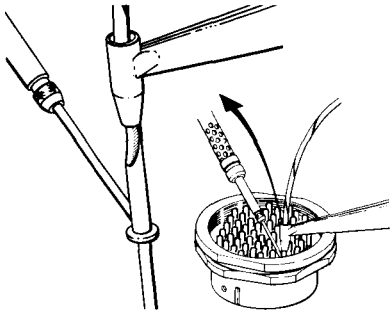


Tapered roller bearing.

This 511-page textbook presents a comprehensive review of the most recent advances in the field of bearing technology. In addition to discussing fundamentals, it reviews current technological problems and states anticipated future problems in aircraft, missiles, and spacecraft. Through its stress on basic principles, the book should assist in finding solutions for advanced problems.

The extensive text covers the principles of boundary lubrication, hydrodynamic theory, hydrostatic bearings, gas-lubricated bearings, rolling-element bearings, and modern developments in liquid lubricants.

In the commentary on bearings lubricated by liquid metals, the authors highlight the problems of hydrodynamics and of using materials at high temperatures. Fatigue in roller-element bearings, problems in bearing operation, and the effects of vacuum and radiation are also covered. (511 pp., $1.75)

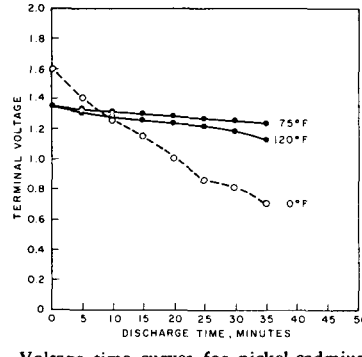


Electrical resistance soldering.

Reliable Electrical Connections
NASA SP–5002

Competent craftsmen and properly used equipment are the key to reliable electrical connections. The revised third edition of this popular guide has proved of value for in-plant training sessions in the latest techniques, tools, materials, and standards. Simply written and clearly illustrated, the manual shows precisely how to handle wires and tools, how to obtain a good solder joint, and how to lace cables and harness assemblies. Procedures for printed circuit boards are fully elaborated. Twelve pages of graphic symbols and charts enhance the usefulness of the handy-size (5½ x 8 inch) booklet. (67 pp., $0.70)

Space Batteries NASA SP–5004



Voltage time curves for nickel-cadmium cells at various temperatures.

A guide to the integration of electrochemical sealed-cell batteries in a vehicle system, this handbook describes the methods necessary to develop an energy storage system based on a solar photovoltaic converter. Nickel-cadmium, silver-zinc, and silver-cadmium batteries are discussed, and factors of weight, charge and discharge characteristics, and severity and longevity of service noted. Latest methods of improving materials, structural components, and assembly techniques are described, and typical deficiencies in the separator, seals, and cell unformity (such as leaks in sealed cells) are analyzed. One useful feature is the comparison of the different battery types in such areas as cycle life and energy and current efficiency. A review of typical acceptance and qualification tests is included. (53 pp., $0.25)

The Measurement of Blood Pressure in the Human Body
NASA SP–5006

This summary of recent advances in blood-pressure measurement, which discusses methods devised for bioastronautic automatic monitoring systems, is directed to nonmedical scientists and engineers.

Several novel methods have been devised, including a pressure transducer designed as a finger cuff, which can be adapted to operating-room use or possibly for a telephone-type hookup. Another cuff device is based on a photosphygmometer. Both are for use when blood pressure cannot be readily determined by auscultatory means. One promising method, still under development, is arterial tonometry, a technique that uses force transducers where a major artery lies close to the skin. A bibliography listing 201 sources will be of interest to researchers. (34 pp., $0.30)

MEASUREMENT OF THE HEARTBEAT OF BIRD EMBRYOS WITH A MICROMETEORITE TRANSDUCER NASA SP–5007

This report describes a new ultrasensitive momentum transducer, originally intended as a micrometeorite sensor, which has wide application for biomedical research and vaccine manufacture.

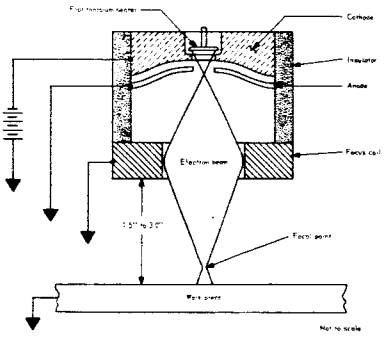
As developed by NASA, the transducer is a pair of piezoelectric beams arranged as springs and acceleration detectors. It can support a mass of 60 grams and still achieve a sensitivity of 10^{-5} dyne-seconds with dynamic range of approximately eight orders of magnitude. It has proven useful for detecting motions of small living organisms, and was able to detect life in a Bobwhite quail embryo only four days after beginning of incubation, without altering the embryo in any manner. Such a development can alleviate problems introduced by probes or other techniques in studying the effect of drugs in chick embryos. (10 pp., $0.50)

SELECTED WELDING TECHNIQUES, PART II NASA SP–5009

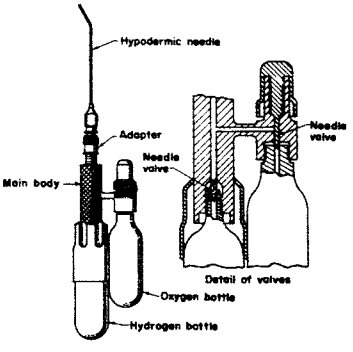
Improved welding techniques for aluminum sheet and plate and for exotic metals developed at the George C. Marshall Space Flight Center are summarized here. Although not all the processes described are new, recent and novel modifications adaptable to industrial applications are covered.

For example, one method uses a square butt joint and the gas tungsten-arc welding process to join 1-inch aluminum alloy plates. Metallurgical properties of such welds are equal to or better than conventional welds. Another method uses the same type of process for continuous weld of large aluminum tank segments with varying thickness. Both methods are faster and less costly than techniques now in general use.

An unusual edge-upset process increases weld joint strength and eliminates machine operations. (34 pp., $0.30)



The 30-kw Pierce-type electron gun used in Saturn V construction.



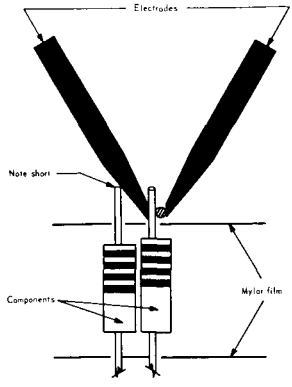
An ingenious miniature cutting torch.

SELECTED SHOP TECHNIQUES NASA SP–5010

The unusual fabrication and production requirements of NASA's various centers have often obliged its engineers and technicians to overcome obstacles by improvising, by creating new tools, or by applying old and sometimes nearly forgotten techniques to new fields. In the belief that many of these schemes, devices, or innovations might prove to be widely useful in industry, this handbook has been prepared for machinists, mechanics, and those working in related crafts. The well-illustrated, 102-page publication describes simply and clearly how members of the NASA team solved a number of special shop problems.

A representative entry, illustrated here, explains how Jet Propulsion Lab

personnel filled a need for a miniature cutting torch that would produce a smaller cutting flame than conventional torches provide. They made one out of an oxygen bottle, a hydrogen bottle, and a hypodermic needle. (101 pp., $0.60)



Shorting component leads.

WELDING FOR ELECTRONIC ASSEMBLIES NASA SP–5011

Resistance spot welding to interconnect electronic components has many advantages, but it is a process requiring proper application of methods and equipment, followed by thorough inspection.

This practical guide outlines the basic steps for obtaining the optimum weld, from determining the controllable variables of specific materials and equipment by an iso-strength diagram to equipment usage, and inspection and process controls. The book is organized so that it can serve as an on-the-job training guide. It points out that proper design and procurement before welding—the first step to effective process control—will curtail problems, and lists operation methods that will reduce faulty welds.

A survey of packaging methods is included, and there is a discussion of the proper equipment required to insure correct power-supply capacitance, weld-pulse characteristics, and circuit resistance.

A useful glossary of welding terminology, appendices listing welding specification documents, and the outline of an assembler/operator course conclude the book. (81 pp., $0.40)

EFFECTS OF LOW TEMPERATURES ON STRUCTURAL METALS NASA SP–5012

Current advances in cryogenic engineering, particularly in the susceptibility of materials to brittle failure under decreasing temperatures, have wide industrial potential. A continuing program at Marshall Space Flight Center has evaluated 29 alloys at cryogenic temperatures in order to improve their yield-strength curve and lessen detrimental effect of welding on ductility.

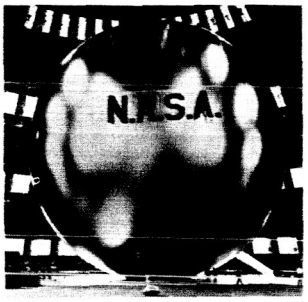
This report presents new tabular data for all alloys tested—aluminum, nickel, steel, titanium, and magnesium—recording their ultimate tensile strength, yield strength, elongation, and notched-unnotched strength ratio. This ready-reference handbook will aid the industrial user concerned with structure design and materials selection for refrigeration, superconductors, medical cryogenics, and natural gas liquefaction. (55 pp., $0.40)

PRECISION TOOLING TECHNIQUES NASA SP–5013

Eight new devices and concepts for high-precision tooling are described in this handbook.

One easily constructed and versatile instrument support system permits lateral adjustment to within one-millionth of an inch. Another fixture holder for use with a lathe or jig borer not only increases accuracy but allows transfer of a part from one machine to another with a minimum of setup time.

Other time-saving devices described are a measuring instrument that requires only one manhour to obtain the same result as 12 manhours with an autocollimator or theodolite, and an air-bearing-mounted measuring device that can measure to within 10 microinches of parallel at any time during manufacture of precision parts. (25 pp., $0.25)



Echo II satellite.

NASA CONTRIBUTIONS TO THE TECHNOLOGY OF INORGANIC COATINGS NASA SP-5014

The wide spectrum of NASA research in inorganic coatings is summarized in this detailed publication. In discussing thermophototropic coatings, the text constructs a phenomenological model to describe the response of the materials used. Such a model can be applied to thermal analysis of the systems utilizing thermophototropic coatings for temperature control. These coatings may have commercial application for windows and automobile windshields, roofing materials, or self-controlled energy collection surfaces. Another area of research, thermal control coatings, is also useful for solar energy conversions and thermal radiation control, as well as for lubricants, thermal insulation, and refractory metal coatings.

An extensive bibliography of the papers published by NASA on inorganic coatings and pigments completes this volume. (268 pp., $1.00)

A TECHNIQUE FOR JOINING AND SEALING DISSIMILAR METALS
NASA SP-5016

A new boltless attachment and sealing method designed to fasten and seal pressure vessels may have interesting industrial implications. Designed for high-pressure use over a temperature range of from 70° F to — 452° F, it has been reliable in cryogenic applications at pressures up to 2000 psi. Joint construction is based on configured male and female members with a third material, perhaps an alloy of low melting point, in the resulting cavity. It features ease of assembly and disassembly, reusability of components, an effective pressure seal, minimum induced stress in the cylinder component, and the ability to connect dissimilar materials. The concept can be extended to many positioning, joining, and sealing applications by using different alloys or nonmetals. (8 pp., $0.25)

METAL-FORMING TECHNIQUES
NASA SP-5017

This is a survey, guide, and reference work on metal-forming techniques for sheet and plate materials used today by the airframe and aerospace industries. It also covers several techniques still in the experimental stage, such as magnetic forming and hot-drape forming.

Details about the 25 techniques discussed incorporate the most recent improvements and adaptations developed by NASA's Marshall Space Flight Center and its contractors. A bibliography is appended. (52 pp., $0.40)

Early electrodes, wire, pressure transducer and adapter, transducer mounting pipe, and die.

ADVANCED VALVE TECHNOLOGY NASA SP-5019

This timely handbook covers problems and solutions in almost every facet of valve design. The study summarizes some unique designs and applications. One such design permits seating despite misalignment of the stem. Other

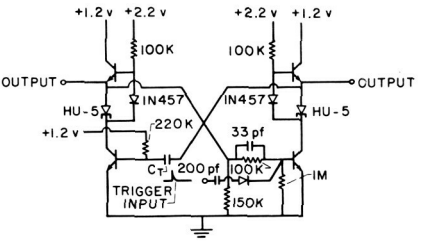
designs include a rotary valve for sequence timing operations, valves with no moving parts, and for refrigeration systems a self-sealing disconnect that forms a metal seal after break-away.

Additional features in the book are a series of comparison charts on liquid-propellant valves and two valve parameter charts. Abstracts of recently published guides—not generally available to designers because of previously limited distribution—are aso included. (182 pp., $1.50)

Micropower Logic Circuits NASA SP–5022

Low-cost digital logic circuits that are designed for a low power consumption and that offer packaging advantages are another research development from NASA. Developed during studies on ultra-low-power circuits, the circuits can be easily modified for nonspace computer systems, automated production systems, remote controls and alarm systems, numerically controlled machine tools, or radio and recording systems.

One monostable multivibrator has a pulse width that can be varied from a few microseconds to many milliseconds. A toggle flip-flop has a density of 130 components per cubic inch. Other innovations are a single-pulse generator, a multiple-input trigger circuit, and a simple, high-efficiency dual-voltage power supply. The last does not use a special transformer and can be adapted to many industrial uses. The "industrialized" performance characteristics show that these digital logic modules far surpass conventional circuits. (15 pp., $0.75)



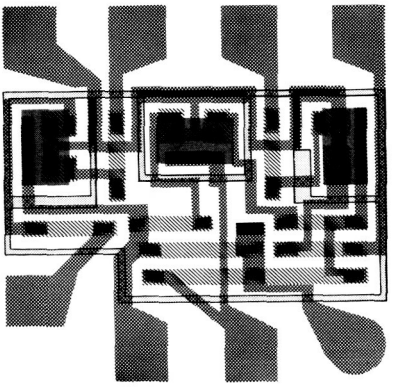
Monostable multivibrator.

Medical and Biological Applications of Space Telemetry NASA SP–5023

Biotelemetry devices developed for space use have numerous terrestrial applications. This concise analysis describes recent space-telemetry advances and outlines research areas in which industry may make further advances.

An introductory chapter provides a general review and description of biotelemetry systems used in space and compares their applications with nonspace uses. Individual studies follow that explore the applications of telemetry in surgery and anesthesiology, in intensive-care wards, in diagnostic monitoring, and in psychophysiological research. Another study deals with practical considerations of biotelemetry in medicine and biology, especially as the problems involve circuit design and microminiaturization.

The text is followed by a glossary of telemetry terms and by listings of individuals and corporations involved in biotelemetry work. (66 pp., $0.45)



Monolithic block circuitry.

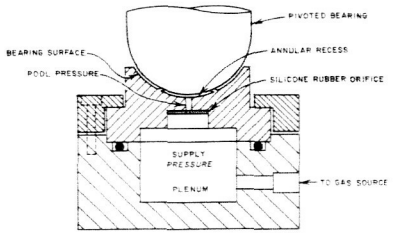
Technical and Economic Status of Magnesium-Lithium Alloys
NASA SP–5028

The TOW ground-to-ground missile-launcher model is among weapons utilizing a magnesium-lithium alloy.

Magnesium-lithium alloys are the lightest structural metals available commercially. Their combination of lightness and stiffness has established them as the newest aerospace material.

NASA was largely responsible for introducing these light metals to the manufacturers of missile and space hardware, through sponsoring the first research on their evaluation. Since then, aerospace companies have generated much more data on the properties and use of the alloys, especially LA141A.

This 45-page study is a report to management on the general characteristics of the alloys, their current applications in space and defense programs, and speculation regarding their possible future commercial usefulness. (45 pp., $0.25)



Assembly of gas-lubricated bearing regulated by an elastic orifice.

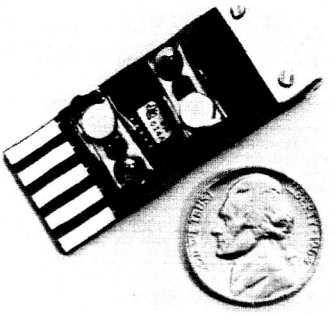
Elastic Orifices for Gas Bearings
NASA SP–5029

The development of the elastic orifice as a means of flow control may revolutionize the field of bearing design. Its use in tests described in this study has revealed that it provides a threefold increase in bearing stiffness over that obtained with a conventional fixed orifice. Preliminary experiments, also detailed in the present study, indicate that the elastic orifice may permit extensive use of gas-lubricated bearings in applications formerly restricted to pressurized liquid and rolling contact bearings. The booklet includes information that will permit construction of working models of these orifices for verification of experimental results. (11 pp., $0.20)

Microelectronics in Space Research
NASA SP–5031

Microelectronics comprises those technologies by which electronic-circuit functions are fabricated in small solid structures, which can be both reliable and inexpensive. The availability of microelectronic devices allows the electronics engineer to implement many missions that otherwise would not be feasible or would be done less efficiently.

This 130-page report primarily provides



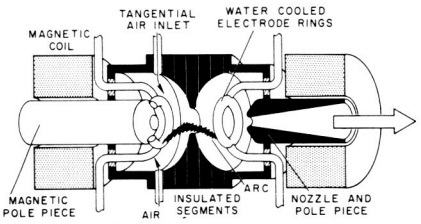
Integrated circuit flatpack.

information on the contributions to microelectronics that have originated in NASA research programs. It considers the limitations of the various technologies used, and places considerable emphasis on silicon integrated-device technology, because of its relatively large importance. The report does not deal with microminiaturization aimed solely at reducing the size of components and circuits. (130 pp., $0.60)

HANDLING HAZARDOUS MATERIALS NASA SP–5032

This handbook deals with highly reactive materials that have been studied in the search for fuels and oxidizers for space work. These include liquid hydrogen, pentaborane, fluorine, chlorine trifluoride, ozone, nitrogen tetroxide, and hydrazine and its derivatives.

The handbook describes both the hazards that have restricted the use of these materials and the procedures by which they have been safely handled and stored. It also discusses various fire-extinguishing actions and their relative importance. Bibliographies of NASA-generated research reports on the topics covered are provided to enable interested readers to investigate the work in depth. (93 pp., $0.45)



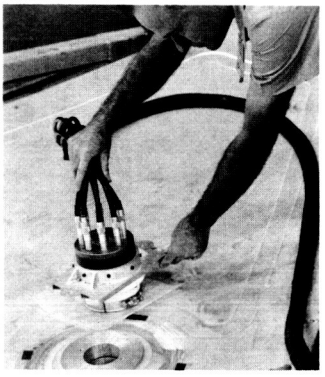
Constricted arc heater.

PLASMA JET TECHNOLOGY
NASA SP–5033

With the advent of the missile and space age, it became necessary to simulate reentry conditions in the laboratory, in order to investigate the many phenomena that missiles and spacecraft encounter as they return to earth. The effort to produce these conditions has led to the development of large arc heaters and plasma jets that can be controlled precisely to give the exact parameters desired. Small, compact, and low-power thrustors have also been developed, leading to small cutting and welding torches and high-intensity light sources.

This 200-page Technology Survey emphasizes the industrial potential of plasma generators in materials testing, coating, and spraying, in chemical synthesis, and in other industrial operations. It includes accounts of NASA contributions to such technology and the instrumentation involved, and lists NASA plasma-arc facilities. (200 pp., $1.00)

THE ELECTROMAGNETIC HAMMER
NASA SP–5034


Using an electromagnetic hammer.

Investigators at Marshall Space Flight Center have successfully used a pancake electromagnetic coil, driven by electric-discharge equipment, to remove distortions from welded rocket components. The process is unusual in that it requires no tooling other than the magnetic coil. A typical application for it has been that of smoothing out fuel-tank domes for the giant Saturn V launch vehicle.

This report describes experimental electromagnetic hammers used at Marshall Space Flight Center, details their operating characteristics, and explains how they were built, in the hope that others may carry their development further and discover new applications for them. (21 pp., $0.25)

Early advances in tungsten metallurgy were made in industrial laboratories, with private funds. The technology later received considerable attention in the aerospace industry because it produced metal of high strength at very high temperatures. The greatest contributions to space-oriented tungsten technology, however, have been made in Government-funded laboratories or other facilities, of which NASA is a notable example. This study of tungsten-powder metallurgy as related to space vehicles and other unorthodox applications explores the work done by NASA. It was undertaken to make the advanced state of this particular art more widely available. (39 pp., $0.35)

Tech Briefs

Tech Briefs are one- or two-page bulletins concerning individual NASA innovations, devices, methods, or concepts arising from the space program and having possible application in science, commerce, or industry. These new developments are published quickly in order to reach potential users as soon as possible and to encourage commercial application. They are published and distributed under these five general categories:

01 Electrical (Electronic)
02 Energy Sources
03 Materials (Chemistry)
04 Life Sciences
05 Mechanical

The following list of Tech Briefs is complete to date. Use the order blank in the back of this booklet if you wish to obtain any of them. List the Tech Briefs by both category and number, and mail the blank to:

Scientific and Technical Information Facility
P.O. Box 33
College Park, Maryland 20740

Tech Brief No.	Title
	01 ELECTRICAL (ELECTRONIC)
B63-10006	Setting of Angles on Machine Tools Speeded by Magnetic Protractor
B63-10024	Solenoid Permits Remote Control of Stop Watch and Assures Restarting
B63-10027	Increased Performance Reliability Obtained with Dual/Redundant/Oscillator System
B63-10033	Indium Foil with Beryllia Washer Improves Transistor Heat Dissipation
B63-10091	Modified Filter Prevents Conduction of Microwave Signals Along High-Voltage Power Supply Leads
B63-10118	Stepping Switch with Simple Actuator Provides Many Contacts in Small Space
B63-10174	Modular Chassis Simplifies Packaging and Interconnecting of Circuit Boards
B63-10193	Removable Preheater Elements Improve Oxide Induction Furnace
B63-10227	Electromechanically Operated Camera Shutter Provides Uniform Exposure
B63-10229	Flange on Microwave Antenna Subreflector Cuts Ground Noise
B63-10238	Shaped Superconductor Cylinder Retains Intense Magnetic Field
B63-10250	Level of Super-Cold Liquids Automatically Maintained by Levelometer
B63-10255	Transfluxor Circuit Amplifies Sensing Current for Computer Memories
B63-10258	Double-Throw Microwave Device Switches Two Lines Quickly
B63-10262	Igniting System for Mercury Vapor Lamps Protects Transistorized Sustaining Supply
B63-10264	Novel Horn Antenna Reduces Side Lobes, Improves Radiation Pattern
B63-10280	Meter Accurately Measures Flow of Low-Conductivity Fluids
B63-10284	Small Digital Recording Head Has Parallel Bit Channels, Minimizes Cross Talk
B63-10321	Improved Variable-Reluctance Transducer Measures Transient Pressures
B63-10338	Optics Used to Measure Torque at High Rotational Speeds
B63-10342	Radiant Heater for Vacuum Furnaces Offers High Structural Rigidity, Low Heat Loss
B63-10440	New Apparatus Increases Ion Beam Power Density

Tech Brief No.	Title
B63-10443	Improved Sensor Counts Micrometeoroid Penetrations
B63-10493	Two-Stage Emitter Follower Is Temperature Stabilized
B63-10508	Circuit Switches Latching Relay in Response to Signals of Different Polarity
B63-10511	Frequency-Shift-Keyer Circuit Improves PCM Conversion for Radio Transmission
B63-10512	Low-Cost Tape System Measures Velocity of Acceleration
B63-10514	Computer Circuit Will Fit on Single Silicon Chip
B63-10529	Connector for Thermocouple Leads Saves Costly Wire, Makes Reliable Connectors
B63-10536	Hot-Air Soldering Technique Prevents Overheating of Electrical Components
B63-10537	Simple Circuit Provides Adjustable Voltage with Linear Temperature Variation
B63-10551	Unmanned Seismometer Levels Self, Corrects Drift Errors
B63-10553	Transistorized Trigger Circuit Is Frequency-Controllable
B63-10554	Highly Efficient Square-Wave Oscillator Operator at High Power Levels
B63-10555	Computer Determines High-Frequency Phase Stability
B63-10561	Tiny Sensor-Transmitter Can Withstand Extreme Acceleration, Gives Digital Output
B63-10567	Simple Circuit Continuously Monitors Thermocouple Sensor
B63-10572	Device Calibrates Vibration Transducers at Amplitudes up to 20G.
B63-10579	Small Foamed Polystyrene Shield Protects Low-Frequency Microphones from Wind Noise
B63-10596	Front and Back Printed Circuit Layouts Presented on Single Sheet
B63-10597	Precision Gage Measures Ultrahigh Vacuum Levels
B63-10599	Liquid Switch Is Remotely Operated by Low DC Voltage
B63-10600	Circuit Controls Transients in SCR Inverters
B63-10603	Monostable Circuit with Tunnel Diode Has Fast Recovery
B63-10606	New Sintering Process Adjusts Magnetic Value of Ferrite Cores
B63-10609	Temperature-Sensitive Network Drives Astable Multivibrator
B63-10613	Cryogenic Waveguide Window Is Sealed with Plastic Foam
B64-10002	Circuit Reliability Boosted by Soldering Pins of Disconnect Plugs to Sockets
B64-10004	Ultra-Sensitive Transducer Advances Micromeasurement Range
B64-10007	Low-Power Transistorized Circuit Provides Staircase Waveform
B64-10010	Modified RF Coaxial Connector Ends Vacuum Chamber Wiring Problem
B64-10016	Compact Coaxial Connector for Printed Circuit Adds Reliability
B64-10017	Blocking Oscillator Uses Low Triggering Voltage
B64-10019	New Method Used to Fabricate Gallium Arsenide Photovoltaic Device
B64-10024	Efficient Circuit Triggers High-Current, High-Voltage Pulses
B64-10042	Ohmmeter Senses Depletion of Lubricant in Journal Bearings
B64-10064	Digital Logic Elements Provide Additional Functions from Analog Input
B64-10065	Continuity Tester Screens Out Faulty Socket Connections
B64-10080	Improved Insertion-Loss Tester
B64-10109	Analog Device Simulates Physiological Waveforms
B64-10114	Auxiliary Silver Electrode Eliminates Two-Step Voltage Discharge Characteristic of Silver-Zinc Cells
B64-10118	Use of Photographs Speeds Inspection of Printed-Circuit Boards
B64-10122	Simple Transducer Measures Low Heat-Transfer Rates
B64-10143	Field-Effect Transistor Improves Electrometer Amplifier
B64-10144	Ring Counter May Be Advanced or Retarded by Command Signal
B64-10150	Novel Circuit Combines Pulse Stretcher with NOR Gate
B64-10158	Emission Tester for High-Power Vacuum Tubes
B64-10163	Field Effect Transistors Used as Voltage-Controlled Resistors
B64-10171	Subminiature Biotelemetry Unit Permits Remote Physiological Investigations
B64-10173	High-Pass RF Coaxial Filter Rejects DC and Low Frequency Signals
B64-10200	Binary System Generates Sidereal Rate from Standard Solar Rate
B64-10209	Raster Linearity of Video Cameras Calibrated with Precision Tester
B64-10222	Compact Cartridge Drives Coded Tape at Constant Readout Speed
B64-10226	Temperature-Compensation Circuit Stabilizes Performance of Vidicons
B64-10237	Apparatus Measures Concentration of Suspended Droplets in Gas Streams
B64-10255	Electronic Device Simulates Respiration Rate and Depth
B64-10258	Digital Cardiometer Computes and Displays Heartbeat Rate
B64-10259	Pneumotachometer Counts Respiration Rate of Human Subject
B64-10271	Improved Technique for Localizing Electropolishing Features Novel Nozzles
B64-10280	Servo System Facilitates Photoelastic Strain Measurements on Resins
B64-10281	PTC Thermistor Protects Multiloaded Power Supplies
B64-10283	Mounting for Diodes Provides Efficient Heat Sink
B64-10299	Radiation Detector-Optical Hanging Device Is of Simplified Construction
B64-10305	Transistorized Converter Provides Nondissipative Regulation

Tech Brief No.	Title
B64-10309	Welding Procedure Improves Quality of Welds, Offers Other Advantages
B64-10320	Voltage Generator Sweeps Oscillator Frequency Linearly with Time
B64-10330	Economical Fabrication Process Produces High-Quality Junction Transistors
B64-10349	Bandwidth Switching Is Transient-Free, Avoids Loss of Loop Lock
B65-10001	Circuit Converts AM Signals to FM for Magnetic Recording
B65-10002	Tunnel-Diode Circuit Features Zero-Level Clipping
B65-10005	Computer Modification Reduces Time of Performing Iterative Division
B65-10006	Modification Increases Light Output of Injection-Luminescent Diodes
B65-10010	Inexpensive, Stable Circuit Measures Heart Rate
B65-10011	Circuit Improvement Produces Monostable Multivibrator with Load-Carrying Capability
B65-10012	Helical Coaxial-Resonator Makes Excellent RF Filter
B65-10013	Zener Diode Function Generator Requires No External Reference Voltage
B65-10018	Carbon Arc Ignition Improved by Simple Auxiliary Circuit
B65-10023	Miniature Stress Transducer Has Directional Capability
B65-10025	Logic Redundancy Improves Digital System Reliability
B65-10026	Stepping Motor Drive Circuit Designed for Low Power Drain
B65-10028	Transistor Voltage Comparator Performs Own Sensing
B65-10030	Library of Documents Compressed into Lap-Held Display Kit
B65-10033	Photoelectric Semiconductor Switch Operates with Low Level Inputs
B65-10041	Pulse Height Analyzer Operates at High Repetition Rates, Low Power
B65-10045	Thermistor Connector Assembly Increases Accuracy of Measurements
B65-10047	Circuit Detects Errors in Address Currents for Magnetic Core Arrays
B65-10048	Microparticle Impact Sensor Measures Energy Directly
B65-10050	Nulling Pyrometer Uses Kerr Cell Shutter for Fast Response
B65-10051	Metal Sheath Improves Thermocouple Using Graphite in One Leg
B65-10052	Zener Diode Is Starter for Transistor-Regulated Power Supply
B65-10054	Pulse Generator Permits Nondestructive Testing of Component Breakdown Voltage
B65-10055	FM Oscillator Uses Tetrode Transistor
B65-10056	Vibrating-Membrane Electrometer Has High Conversion Gain
B65-10057	Feed-Through Has Polyterminal Feature
B65-10059	Metal Diaphragm Used to Calibrate Miniature Transducers
B65-10061	Simple Control Device Senses Solar Position
B65-10062	Pulsed Plasma Accelerator Operates Repetitively Without Complex Controls
B65-10066	Fuel Cell Serves as Oxygen Level Detector
B65-10067	Sensitive Level Sensor Made with Spirit Level, Gives Electrical Output
B65-10068	Automatic Thermal Switch Accelerates Cooling-Down of Cryogenic System
B65-10069	Feedback Oscillator Functions as Low-Level Pulse Stretcher
B65-10072	Synchronized Pulse Generator Needs No External Power
B65-10073	System Measures Angular Displacement Without Contact
B65-10076	Light-Sensitive Potentiometer Measures Product of Two Variables
B65-10079	Photoelectric Sensor Output Controlled by Eyeball Movements
B65-10080	Phase Detector Circuit Synthesizes Own Reference Signal
B65-10085	Transducer Senses Displacements of Panels Subjected to Vibration
B65-10086	System Selects Framing Rate for Spectograph Camera
B65-10087	Apparatus Measures Swelling of Membrane in Electrochemical Cells
B65-10089	Transducer Measures Temperature Differentials in Presence of Strong Electromagnetic Fields
B65-10091	Simulator Produces Physiological Waveforms
B65-10093	Computer Programs Simplify Optical System Analysis
B65-10096	Digital System Accurately Controls Velocity of Electromechanical Drive
B65-10097	Variable Voltage Supply Uses Zener Diode as Reference
B65-10102	Simple Circuit Functions as Frequency Discriminator for PFM Signals
B65-10103	Improved Magnetometer Uses Toroidal Gating Coil
B65-10105	Variable Load Automatically Tests DC Power Supplies
B65-10108	Magnetic Field Controls Carbon Arc Tail Flame
B65-10112	Unijunction Frequency Divider Is Free of Backward Loading
B65-10114	Averaging Probe Reduces Static-Pressure Sensing Errors
B65-10118	Transistorized Circuit Clamps Voltage with 0.1% Error
B65-10119	Variable Frequency Transistor Inverters Use Multiple Core Transformers
B65-10120	Multiple Test Tubes Stirred Mechanically
B65-10123	Efficient Thin Film Heating Element Takes Minimum Space
B65-10124	Variable Frequency Magnetic Multivibrator Generates Stable Square-Wave Output
B65-10125	Simplified Electrometer Has Excellent Operating Characteristics

Tech Brief No.	Title
B65-10127	Traveling-Wave Tube Circuit Simplifies Microwave Relay
B65-10128	Piezoresistive Gage Tests Pin-Connector Sockets
B65-10137	Instrument Calibrates Low Gas-Rate Flowmeters
B65-10138	High-Gain Amplifier Has Excellent Stability and Low Power Consumption
B65-10139	Spherical Electrode Eliminates High-Voltage Breakdown
B65-10142	Auxiliary Circuit Enables Automatic Monitoring of EKG's
B65-10143	Digital Output Cardiotachometer Measures Rapid Changes in Heartbeat Rate
B65-10145	Logarithmic Amplifier Uses Field Effect Transistors
B65-10146	Frequency Offset in Linear FM/CW Transponder Eliminates Clutter
B65-10151	Rotor Position Sensor Switches Currents in Brushless DC Motors
B65-10152	Circuit Reduces Distortion of FM Modulator
B65-10158	Laser Beam Transmits Electric Power
B65-10159	Solid-State Switching Used to Speed Up Capacitive Integrator
B65-10161	Interferometer Combines Laser Light Source and Digital Counting System
B65-10165	Superconductor Magnets Used for Stagger-Tuning Traveling-Wave Laser
B65-10169	Phase Shift Frequency Synthesizer Is Efficient, Small in Size
B65-10178	DC to AC Converter Operates Efficiently at Low Input Voltages
B65-10182	Force Controlled Solenoid Drives Microweld Tester
B65-10183	Modified Interelement Spacing Improves Yagi Antenna Array
B65-10184	Pressure Sensor Responds Only to Shock Wave
B65-10187	Crystal Measures Short-Term, Large-Magnitude Forces
B65-10193	Logic Circuit Exhibits Optimum Performance
B65-10194	Analog-to-Digital Converter Has Increased Reliability and Reduced Power Consumption
B65-10195	Device Measures Fluid Drag on Test Vehicles
B65-10196	Inexpensive Electrical Connector Is Moisture and Corrosionproof
B65-10197	Improved Solderless Connecter Is Easily Disconnected
B65-10199	Modular Thermoelectric Cell Is Easily Packaged in Various Arrays
B65-10200	Density Trace Made with Computer Printout
B65-10202	Quick-Disconnect Coupling Provides Safe Transfer of Hazardous Fluids
B65-10203	Tiny Biomedical Amplifier Combines High Performance, Low Power Drain
B65-10204	Voltage Variable Oscillator Has High Phase Stability
B65-10206	Sensitive Electrometer Features Digital Output
B65-10208	Hybrid Computer Technique Yields Random Signal Probability Distributions
B65-10209	Oscillator Circuit Measures Liquid Level in Tanks
B65-10212	Detector Circuit Compensates for Vidicon Beam Current Variations
B65-10213	Multiaxial Analyzer Detects Low-Energy Electrons
B65-10215	Electrical Probe Ensures Reliable Contact in Socket
B65-10218	Graphite Element Serves as Radiant Heat Source
B65-10221	Instrument Accurately Measures Extremely Low Air Densities
B65-10223	Voltage-Controlled Oscillator Is Easily Aligned, Has Low Phase Noise
B65-10225	Simple BCD Circuit Accurately Counts to 24
B65-10226	Magnetic-Shift-Register Circuit Controls Step Motor Operation
B65-10228	Simple Circuit Produces High-Speed, Fixed Duration Pulses
B65-10233	High-Speed Square-Wave Current Limiter Operates Efficiently
B65-10234	Simple Circuit Reduces Transistor Switching Time
B65-10237	Brushless DC Motor Uses Electron Beam Switching Tube as Commutator
B65-10238	Solid-State Laser Transmitter Is Amplitude Modulated
B65-10242	Electrometer Has Automatic Zero Bias Control
B65-10243	Novel Probe Simplifies Electronic Component Testing
B65-10244	Lightweight Coaxial Cable Connector Reduces Signal Loss
B65-10247	Servo Calorimeter Measures Material Heating Rate
B65-10249	Manual-Feed Adapter Permits Microfilming of Continuous Oscillograph Output
B65-10255	BF_3 Nuclear Detector Preamplifier Uses Single Cable Connection
B65-10257	Inductor Flyback Characteristic Gives Voltage Regulator Fast Response
B65-10258	Gapped Toroid Provides Infinite Resolution of Delay-Line Pickup
B65-10259	Increased Junction Lead Inductance Ballasts High-Frequency Transistors
B65-10260	Simple Pulse Counting Circuit Computes Sum of Squares
B65-10263	Indexing Device Ensures Proper Mating of Electrical Connectors
B65-10264	Plastic Bags in Evacuated Chamber Make Lightweight Gas Sampling System
B65-10265	Weld Leaks Rapidly and Safely Detected
B65-10267	Electrometer Preamplifier Has Drift Correction Feedback
B65-10268	Multiple Test Chamber Exposes Materials to Various Environments
B65-10269	Simple Device Produces Accelerometer Calibration Pulse
B65-10279	Inflatable Bladder Provides Accurate Calibration of Pressure Switch
B65-10281	Circuit Maintains Digital Decision Threshold at Preset Level

Tech Brief No.	Title
B65-10282	Constant-Current Regulator Improves Tunnel Diode Threshold-Detector Performance
B65-10271	Composite Seal Reduces Alkaline Battery Leakage
B65-10273	Electromechanical Flowmeter Accurately Monitors Fluid Flow
B65-10274	Electronic Ohmmeter Provides Direct Digital Output
B65-10275	Improved Circuit Minimizes Generation Time of Pseudonoise Check Bits
B65-10276	Added Diodes Increase Output of Balanced Mixer Circuit
B65-10277	Nonlinear Feedback Reduces Analog-to-Digital Converter Error
B65-10278	Modified Developer Increases Line Resolution in Photosensitive Resist
B65-10284	Field-Effect Transistor Replaces Bulky Transformer in Analog-Gate Circuit
B65-10286	Uppercase and Lowercase Computer Printout Increases Readability
B65-10287	Photoresistance Analog Multiplier Has Wide Range
B65-10289	Boron Nitride Housing Cools Transistors
B65-10290	FM/CW System Measures Aircraft Attitude
B65-10293	Electrostatically Driven Dynamic Capacitor Employs Capacitive Feedback
B65-10298	Titanium Diaphragm Makes Excellent Amplitron Cathode Support
B65-10299	Electropneumatic Rheostat Regulates High Current
B65-10300	Impurity Diffusion Process for Silicon Semiconductors Is Fast and Precise
B65-10301	Remote Rapidly Varying Pressures Accurately Measured
B65-10304	Improved Strain-Wire Flowmeter Has Fast Response Time
B65-10305	Thin-Film Resistors Used in Functional Electronic Blocks
B65-10306	Opaque Microfiche Masthead Permits Easy Reading
B65-10307	Frequency Correction Device Uses Digital Circuitry
B65-10308	Electronic Ampere-Hour Integrator Is Accurate to One Percent
B65-10309	Thermoelectric Elements Diffusion-Bonded to Tungsten Electrodes
B65-10310	Threshold Detector Produces Narrow Pulses at High Repetition Rates
B65-10311	PCM Magnetic Tape System Efficiently Records and Reproduces Data
B65-10313	Planetary Camera Control Improves Microfiche Production
B65-10314	Hybrid Circuit Achieves Pulse Regeneration with Low Power Drain
B65-10315	Magnetometer Measures Orthogonal Components of Magnetic Fields
B65-10317	Instrument Performs Nondestructive Chemical Analysis; Data Can Be Telemetered
B65-10318	Remote Control Electrical Switching System Has 1000-Output Capability
B65-10320	Rugged Pressed Disk Electrode Has Low Contact Potential
B65-10322	Cam-Operated Limit Switch Features Safe Fuse Replacement
B65-10324	Selenium Bond Decreases On Resistance of Light-Activated Switch
B65-10325	Direct Force-Measuring Transducer Used in Blood Pressure Research
B65-10328	Feed-Through Connector Withstands High Temperatures in Vacuum Environment
B65-10329	Baking Enables McLeod Gauge to Measure in Ultrahigh Vacuum Range
B65-10333	Communication System Uses Modulated Laser Beam
B65-10334	Frequency Divider Is Free of Spurious Outputs
B65-10340	Miniature Servo Accelerometer Is Force-Balanced
B65-10343	Delayed Ripple Counter Simplifies Square-Root Computation
B65-10345	Variable Word Length Encoder Reduces TV Bandwidth Requirements
B65-10347	Compact SCR Trigger Circuit for Ignitron Switch Operates Efficiently
B65-10349	Frequency Discriminator with Binary Output Eliminates Tuned Circuits
B65-10350	Zener Diode Controls Switching of Large Direct Currents
B65-10352	Vibrating Diaphragm Measures High Electrostatic Field Strengths
B65-10353	Multiphase Clock-Pulse Generator Uses Simplified Circuitry
B65-10355	Simple Circuit Performs Binary Addition and Subtraction
B65-10359	Improved Wire Memory Matrix Uses Very Little Power
B65-10361	High-Intensity Flashing Beacon Powered by Mercury Cells
B65-10362	Temperature Transducer Has High Output, Is Time Stable
B65-10363	Regenerative Fuel Cell Combines High Efficiency with Low Cost
B65-10365	Blood-Pressure Measuring System Gives Accurate Graphic Output
B65-10369	Respiratory Transfer Valve Has Fail-Safe Feature
B65-10376	Three-Position Rocker Switch Actuator Has Positive Centering
B65-10377	Binary Counter Uses Fluid Logic Elements
B65-10379	Three-Dimensional Wire-Mesh Capacitor System Measures Fluid Density
B65-10380	Device Detects Unbonded Areas in Plastic Laminates
B65-10381	Keyed Plugs and Sockets Prevent Improper Connections
B65-10382	Photoelectric System Continuously Monitors Liquid Level

Tech Brief No.	Title

02 ENERGY SOURCES

B63-10260	Solar-Angle Sensor Has No Moving Parts
B63-10344	Cooling Method Prolongs Life of Hot-Wire Transducer
B63-10346	New Method Used to Fabricate Light-Weight Heat Exchanger for Rocket Motor
B63-10421	Mirror Device Aligns Machine Surface Perpendicular to Sight Lines
B65-10036	Ionization Vacuum Gage Starts Quickly, Is Unaffected by Spurious Currents
B65-10046	Wide-Aperture Solar Energy Collector Is Light in Weight
B65-10071	Simple Optical System Used to Align Spectrograph
B65-10081	Magnetic Field Test Coils Are Temperature Compensated
B65-10082	Multiple Element Soft X-ray Source Produces Wide Range of Radiation
B65-10084	Modified Contour Projector Makes Excellent Contour Densitometer
B65-10100	Rotating Filters Permit Wide Range of Optical Pyrometry
B65-10122	Microwave Technique Measures Plasma Characteristics
B65-10129	Apparatus Permits Flexure Testing of Specimens at Cryogenic Temperatures
B65-10132	Simple Circuit Positions Film Frames in Projector
B65-10133	Probe Measures Characteristics of Hot Gas Stream
B65-10137	Instrument Calibrates Low Gas-Rate Flowmeters
B65-10157	Internal Cooling Increases Range of Immersion-Type Temperature Probe
B65-10161	Interferometer Combines Laser Light Source and Digital Counting System
B65-10171	Fresnel Zone Plate Forms Images at Wavelengths Below 1000 Angstroms
B65-10186	Electronic Modules Easily Separated from Heat Sink
B65-10188	Refractory Metal Shielding (Insulation) Increases Operating Range of Induction Furnace
B65-10199	Modular Thermoelectric Cell Is Easily Packaged in Various Arrays
B65-10211	Light Ray Modulation Controls Optical System Alignment
B65-10221	Instrument Accurately Measures Extremely Low Air Densities
B65-10224	Heater Decomposes Oil Backstreaming from High-Vacuum Pumps
B65-10239	Ion Pump Provides Increased Vacuum Pumping Speed
B65-10240	Insulation Accelerates Rate of Cooling with Cryogenic Fluid
B65-10252	Distant Objects Detected Visually with Optical Filters
B65-10253	Oil-Damped Mercury Pool Makes Precise Optical Alignment Tool
B65-10268	Multiple Test Chamber Exposes Materials to Various Environments
B65-10280	Electron Bombardment Improves Vacuum Chamber Efficiency
B65-10272	Infrared Shield Facilitates Optical Pyrometer Measurements
B65-10283	Electron-Beam Deflection Controlled by Digital Signals
B65-10291	Spiraled Channels Improve Heat Transfer Between Fluids
B65-10292	Interferometer Construction Assures Parallelism of Critical Components
B65-10295	Unique Construction Makes Interferometer Insensitive to Mechanical Stresses
B65-10296	Coaxial Capacitor Used to Determine Fluid Density
B65-10297	Superconductor Shields Test Chamber from Ambient Magnetic Fields
B65-10301	Remote Rapidly Varying Pressures Accurately Measured
B65-10305	Thin-Film Resistors Used in Functional Electronic Blocks
B65-10315	Magnetometer Measures Orthogonal Components of Magnetic Fields
B65-10317	Instrument Performs Nondestructive Chemical Analysis; Data Can Be Telemetered
B65-10324	Selenium Bond Decreases On Resistance of Light-Activated Switch
B65-10330	Wedge Immersed Thermistor Bolometer Measures Infrared Radiation
B65-10331	Closed Fluid System Without Moving Parts Controls Temperature
B65-10333	Communication System Uses Modulated Laser Beam
B65-10356	Segmented Electrode Increases Operating Pressure of MHD Accelerator
B65-10361	High-Intensity Flashing Beacon Powered by Mercury Cells
B65-10368	Vacuum Chamber Provides Improved Insulation and Support for Cryostat
B65-10373	Modified Procedure Speeds Camera Copy Layout for Offset Printing
B65-10382	Photoelectric System Continuously Monitors Liquid Level

03 MATERIALS (CHEMISTRY)

Tech Brief No.	Title
B65-10179	Reusable Neoprene Jacket Protects Parts for Chemical Milling
B65-10186	Electronic Modules Easily Separated from Heat Sink
B65-10189	Testing Device Subjects Elastic Materials to Biaxial Deformations
B65-10190	IR-Transmission Glasses Formed from Oxides of Bismuth and Tellurium
B65-10214	Emergency Solar Still Desalts Seawater
B65-10217	Thin Transparent Films Formed from Powdered Glass
B65-10220	Thoriated Nickel Bonded by Solid-State Diffusion Method
B65-10250	Coating Method Enables Low-Temperature Brazing of Stainless Steel
B65-10261	Boron Carbide Whiskers Produced by Vapor Deposition
B65-10268	Multiple Test Chamber Exposes Materials to Various Environments
B65-10270	Ceramic Materials Purified by Experimental Method
B65-10271	Composite Seal Reduces Alkaline Battery Leakage
B65-10278	Modified Developer Increases Line Resolution in Photosensitive Resist
B65-10288	Organic Reactants Rapidly Produce Plastic Foam
B65-10294	Adherent Protective Coatings Plated on Magnesium-Lithium Alloy
B65-10302	Burnishing Technique Improves Lubrication of Threaded Fasteners
B65-10303	Nickel Solution Prepared for Precision Electroforming
B65-10309	Thermoelectric Elements Diffusion-Bonded to Tungsten Electrodes
B65-10316	Removable Well in Reaction Flask Facilitates CO_2 Collection
B65-10317	Instrument Performs Nondestructive Chemical Analysis; Data Can be Telemetered
B65-10320	Rugged Pressed Disk Electrode Has Low Contact Potential
B65-10321	Plated Nickel Wire Mesh Makes Superior Catalyst Bed
B65-10335	Magnetic Fluid Readily Controlled in Zero Gravity Environment
B65-10336	Anodization Process Produces Opaque, Reflective Coatings on Aluminum
B65-10337	Special Coatings Control Temperature of Structures
B65-10341	Lightweight Hinged Bellows Restraint Has High Load Capacity
B65-10344	Soluble Undercoating Facilitates Removal of Foamed-in-Place Insulation
B65-10354	Pigmented Coating Resists Thermal Shock
B65-10357	Air-Cured Ceramic Coating Insulates Against High Heat Fluxes
B65-10364	Porous Glass Makes Effective Substrate for Ozone-Sensing Reagent
B65-10366	Unique Gear Design Provides Self-Lubrication
B65-10372	Wire Bundles Formed into Grids with Minute Interstices
B65-10374	Plastic Plus Stainless-Steel Fibers Make Resilient, Impermeable Material
B65-10384	Probe Samples Components of Rocket Engine Exhaust

04 LIFE SCIENCES

B63-10003	New Low-Level A-C Amplifier Provides Adjustable Noise Cancellation and Automatic Temperature Compensation
B64-10025	Improved Electrode Gives High-Quality Biological Recordings
B64-10108	Device Induces Lungs to Maintain Known Constant Pressure
B64-10146	Technique Simulates Effect of Reduced Gravity
B65-10142	Auxiliary Circuit Enables Automatic Monitoring of EKG's
B65-10143	Digital Output Cardiotachometer Measures Rapid Changes in Heartbeat Rate
B65-10316	Removable Well in Reaction Flask Facilitates CO_2 Collection
B65-10320	Rugged Pressed Disk Electrode Has Low Contact Potential
B65-10325	Direct Force-Measuring Transducer Used in Blood Pressure Research
B65-10332	Test Monkeys Anesthetized by Routine Procedure
B65-10365	Blood-Pressure Measuring System Gives Accurate Graphic Output
B65-10369	Respiratory Transfer Valve Has Fail-Safe Feature

Tech Brief No.	Title

05 MECHANICAL

B63-10007	High Purity Electroforming Yields Superior Metal Models
B63-10008	Vacuum Forming of Thermoplastic Sheet Results in Low-Cost Investment Casting Patterns
B63-10009	Chain Friction System Gives Positive, Reversible Drive
B63-10023	V-Slotted Screw Head and Matching Driving Tool Facilitate Insertion and Removal of Screw Fasteners
B63-10123	Elastic Orifice Automatically Regulates Gas Bearings
B63-10139	Method of Welding Joint in Closed Vessel Improves Quality of Seam
B63-10141	Vented Piston Seal Prevents Fluid Leakage Between Two Chambers
B63-10143	Coincident Switch Closing Reduces Error in Motor-Driven Timer
B63-10170	High-Pressure Regulating System Prevents Pressure Surges
B63-10198	Device Transmits Rotary Motion Through Hermetically Sealed Wall
B63-10200	Apparatus of Small Size Can Be Extended into Long, Rigid Boom
B63-10226	Self Sealing Disconnect for Tubing Forms Metal Seal After Breakaway
B63-10228	Packless Valve with All-Metal Seal Handles Wide Temperature, Pressure Range
B63-10236	Lightweight Universal Joint Transmits Both Torque and Thrust
B63-10237	Supercold Technique Duplicates Magnetic Field in Second Superconductor
B63-10240	Sleeve and Cutter Simplify Disconnecting Welded Joint in Tubing
B63-10241	Veitch Diagram Plotter Simplifies Boolean Functions
B63-10247	New Package for Belleville Spring Permits Rate Change, Easy Disassembly
B63-10251	Helical Tube Separates Nitrogen Gas from Liquid Nitrogen
B63-10289	Frictional Wedge Shock Mount Is Inexpensive, Has Good Damping Characteristics
B63-10291	Special Pliers Connect Hose Containing Liquid Under Pressure
B63-10292	Heavy-Duty Staple Remover Operated by Hand
B63-10304	Break-Up of Metal Tube Makes One-Time Shock Absorber, Bars Rebound
B63-10340	Cryopumping of Hydrogen in Vacuum Chambers Is Aided by Catalytic Oxidation of Hydrogen
B63-10341	Design of Valve Permits Sealing Even if the Stem Is Misaligned
B63-10354	Rapid Billet Loader Aids Extrusion of Refractory Metals
B63-10367	Connector for Vacuum-Jacketed Lines Cuts Tubing System Cost
B63-10368	Composite, Vacuum-Jacketed Tubing Replaces Bellows in Cryogenic Systems
B63-10376	Novel Clamps Align Large Rocket Cases, Eliminate Back-Up Bars
B63-10384	Vacuum-Type Backup Bar Speeds Weld Repairs
B63-10385	Flexible Honeycomb Structure Can Bend to Fit Compound Curves
B63-10387	Portable Flooring Protects Finished Surfaces, Is Easily Moved
B63-10420	Simple Mechanism Combines Positive Locking and Quick-Release Features
B63-10431	High-Temperature, High-Pressure Spherical Segment Valve Provides Quick Opening
B63-10435	Portable Display Paneling Has Wide Use, Easy Take Down and Assembly
B63-10442	Kinetic-Energy Absorber Employs Frictional Force Between Mating Cylinders
B63-10489	Fine-Particle Filter Prevents Damage to Vacuum Pumps
B63-10497	Integral Coolant Channels Simply Made by Meltout Method
B63-10502	Fluid-Pressure Meter Can Be Calibrated Without Removal from Flow Line
B63-10517	Miniature Oxygen-Hydrogen Cutting Torch Constructed from Hypodermic Needle
B63-10519	Tool Facilitates Sealing of Metal Fill Tubes
B63-10526	Built-in Templates Speed Up Process for Making Accurate Models
B63-10530	New Anenometer Has Fast Response, Measures Dynamic Pressure Directly
B63-10547	Ellipsoidal Optical Reflectors Reproduced by Electroforming
B63-10556	Lathe Converted for Grinding Aspheric Surfaces
B63-10558	New Method Forms Bond Line Free of Voids
B63-10560	Camera Shutter Is Actuated by Electric Signal
B63-10564	A Technique for Making Animal Restraints
B63-10568	Plastic Molds Reduce Cost of Encapsulating Electric Cable Connectors
B63-10571	Self-Balancing Beam Permits Safe, Easy Load Handling Under Overhang
B63-10590	Stainless-Steel Elbows Formed by Spin Forging
B64-10001	New Inflatable Liferaft Is Nontippable
B64-10006	Speed-Sensing Device Aids Crane Operators
B64-10011	Metal Strip Forms 21 Foot Boom, Rolls Up for Compact Storage
B64-10014	Guide for Extrusion Dies Eliminates Straightening Operation
B64-10015	Comfortable, Lightweight Safety Helmet Holds Radio Transmitter, Receiver
B64-10021	Pressure Transducer 3/8-Inch in Size Can Be Faired into Surface
B64-10028	Quick-Acting Clutch Disengages Idle Drive Motor
B64-10031	Multiple Port Pressure Scanner Valve Features Greater Accuracy, Quicker Data
B64-10050	Modified Gas Bearing Is Adjustable to Optimum Stiffness Ratio

Tech Brief No.	Title
B64-10058	Insulated Weld Tooling Permits Uniform, High-Quality Weld
B64-10066	Encapsulation Process Sterilizes and Preserves Surgical Instruments
B64-10069	Metal-Bending Brake Facilitates Lightweight, Close-Tolerance Fabrication
B64-10084	Molded Elastomer Provides Compact Ferrite-Core Holder, Simplifies Assembly
B64-10119	Buckle Joins Web Straps Quickly, Adjusts Easily
B64-10121	Electronic Assembly Rack Panels Snap On and Off
B64-10124	Attachment Converts Microscope to Point Source Autocollimator
B64-10130	Bearing Transmits Rotary and Axial Motion
B64-10141	Pneumatic Power Is Transmitted Through Air Bearing
B64-10145	Flexible Fastener Allows Thermal Expansion
B64-10164	Upsetting Butt Edge Increases Weld-Joint Strength
B64-10170	Ball Bearing Used in Design of Rugged Flow-Meter
B64-10178	Machine Tests Crease Durability of Sheet Materials
B64-10185	Threading Hook Facilitates Safe Recovery of Heavy Loads
B64-10188	Blade Valve Isolates Compartment in Pipe, Opens to Allow Free Flow
B64-10211	Micromachining Produces Optical Apertures to Micron Dimensions
B64-10223	Two-Part Valve Acts as Quick Coupling
B64-10249	Instrument Adjustment Knob Locks to Prevent Accidental Maladjustment
B64-10272	Viscous-Pendulum Damper Suppresses Structural Vibrations
B64-10274	Vehicle Walks on Varied Terrain, Can Assist Handicapped Persons
B64-10277	Apparatus Alters Position of Objects to Facilitate Demagnetization
B64-10278	Sensitive Low-Pressure Relief Valve Has Positive Seating Against Leakage
B64-10284	Apparatus Measures Very Small Thrusts
B64-10306	Compressed Gas System Operates Semitrailer Brakes During Winching Operation
B64-10327	Connector Seals Fluid Lines at Cryogenic Temperatures and High Vacuums
B64-10348	Safety Restrainer Prevents Whipping of Ruptured High-Pressure Hose
B64-10406	Polychart Contour Plotter Enables Data Extrapolation From Multiple Plotting Charts
B65-10003	Illuminated Display Panel Is Easily Changed
B65-10007	Thermocompression Bonding Produces Efficient Surface-Barrier Diode
B65-10008	Shock Absorber Protects Motive Components Against Overloads
B65-10009	Forming Blocks Speed Production of Strain Gage Grids
B65-10014	Use of Tear Ring Permits Repair of Sealed Module Circuitry
B65-10017	Explosives Actuate Nonmagnetic Indexing Device
B65-10019	Wide-Angle Sensor Measures Radiant Heat Energy in Corrosive Atmospheres
B65-10020	Optical Arrangement Increases Useful Light Output of Semiconductor Diodes
B65-10021	Pickup Device Reads Pressures from Ports in Rotating Mechanisms
B65-10022	Knob Linkage Permits One-Hand Control of Several Operations
B65-10027	Fluid-Pressure Measurement Apparatus Uses Short-Length Manometer Tubes
B65-10029	Seismic Transducer Measures Small Horizontal Displacements
B65-10031	Spring Loaded Beaded Cable Makes Efficient Wire Puller
B65-10035	Oceanborne Transponder Platform Has Good Stability
B65-10037	Improved Holder Protects Crystal During High Acceleration and Impact
B65-10038	Fastener Provides Cooling and Compensates for Thermal Expansion
B65-10039	Nonresonant Support Facilitates Vibration Testing of Structures
B65-10040	Valve Designed with Elastic Seat
B65-10042	Flexure Support System Protects Thermally and Dynamically Loaded Models
B65-10049	Screw Locking Cups Quickly and Neatly Crimped
B65-10053	Seal Allows Blind Assembly and Thermal Expansion of Components
B65-10060	New Alloy Brazes Titanium to Stainless Steel
B65-10063	Ceramic-Coated Boat Is Chemically Inert, Provides Good Heat Transfer
B65-10064	Device Measures Curved Surface Finish on Gear Teeth
B65-10070	Simple Scale Interpolator Facilitates Reading of Graphs
B65-10074	Nitrogen Dioxide Produced by Self-Sustained Pyrolysis of Nitrous Oxide
B65-10075	Tension Is Servo Controlled in Film Advance System
B65-10077	New Coupling Compensates for Shaft Misalignment
B65-10078	Fabrication Method Produces High-Grade Alumina Crucibles
B65-10090	Compact Assembly Generates Plastic Foam, Inflates Flotation Bag
B65-10094	Cutter and Stripper Reduces Coaxial Cable Connection Time
B65-10098	Contact Stresses Calculated for Miniature Slip Rings
B65-10099	Slit Feeds Reduce Unbalanced Torques in Gas-Lubricated Bearings
B65-10101	Jig and Fixture Aid Fabrication of Tungsten Rivets
B65-10104	Leaf-Spring Suspension Provides Accurate Parallel Displacements
B65-10109	Rock Bit Requires no Flushing Medium to Maintain Drilling Speed
B65-10110	Magnets Position X-Ray Film for Weld Inspection
B65-10111	Probe Tests Microweld Strength

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B65-10113	Shock Mount Isolates Pressure Transducers from Vibration
B65-10114	Averaging Probe Reduces Static-Pressure Sensing Errors
B65-10115	Inert Gas Spraying Device Aids in Repair of Hazardous Systems
B65-10116	Low-Cost Tool Minimizes Damage to O-Rings During Installation
B65-10121	Flow Control Valve Is Independent of Pressure Drop
B65-10126	Collapsible Truss Structure Is Automatically Expandable
B65-10130	Collar Positions Strip Stock Used to Form Coil on Mandrel
B65-10131	Apparatus Facilitates Pressure-Testing of Metal Tubing
B65-10134	High Permeability Semiconductors Permit Close-Tolerance Soldering
B65-10135	Coiled Spring Makes Self-Locking Device for Threaded Fasteners
B65-10140	Galvanic Corrosion Reduced in Aluminum Fabrications
B65-10141	Integral Ribs Formed in Metal Panels by Cold-Press Extrusion
B65-10144	Lightweight Load Support Serves as Vibration Damper
B65-10147	Improved Fluid Control Valve Extends Diaphragm Life
B65-10148	Bidirectional Step Torque Filter Eliminates Backlash
B65-10149	Cantilever Springs Maintain Tension in Thermally Expanded Wires
B65-10150	Metal Bellows Custom-Fabricated from Tubing
B65-10153	Titanium Treatment Improves Brazed Joints
B65-10154	System Measures Unidirectional Forces, Excludes Extraneous Forces
B65-10160	Low-Cost Seal Compensates for Surface Irregularities
B65-10163	Device Disconnects Several Couplings Simultaneously
B65-10166	Splice Plate Design Assures Structural Separation by Mild Explosive
B65-10168	Lathe Attachment Used to Machine Elliptical Cones
B65-10170	Metal Parts Hydrosized by Explosive Force
B65-10174	Pressure Transducer System Is Force-Balanced, Has Digital Output
B65-10176	Device Enables Measurement of Moments of Inertia About Three Axes
B65-10177	Epoxy-Resin Patterns Speed Shell-Molding of Aluminum Parts
B65-10179	Reusable Neoprene Jacket Protects Parts for Chemical Milling
B65-10180	New Nut and Sleeve Improve Flared Connections
B65-10181	Hand Tool Bends Component Leads Accurately
B65-10185	Dispensing System Eliminates Torsion in Deployed Hoses
B65-10189	Testing Device Subjects Elastic Materials to Biaxial Deformations
B65-10191	Extendible Column Can Be Stowed on Drum
B65-10192	Spiral Heater Coils Hand-Formed with Fixture
B65-10195	Device Measures Fluid Drag on Test Vehicles
B65-10198	Self-Aligning Fixture Used in Lathe Chuck Jaw Refacing
B65-10201	Electrical Cable Connector-Clamp Has Smooth Exterior Surface
B65-10205	Ball-and-Socket Joints Provide Accurate Biaxial Gimbal
B65-10207	Fluid Check Valve Has Fail-Safe Feature
B65-10210	Fiberglass Dies Speed Forming of Large Metal Sheets
B65-10216	Wire Mesh Isolator Protects Sensitive Electronic Components
B65-10219	Flexible Magnetic Planning Boards Are Easily Transported
B65-10220	Thoriated Nickel Bonded By Solid-State Diffusion Method
B65-10222	Inexpensive Check Valve Is Installed in Standard AN Fittings
B65-10227	Diaphragm Eliminates Leakage in Cryogenic Fluid Duct Coupling
B65-10229	Scoop Attachment Makes Helicopter Recoveries Easier and Safer
B65-10230	Hydraulic Device Provides Accurate Displacements to Microinches
B65-10231	Handtool Facilitates Extraction of Circuit Modules
B65-10235	Angular Glass Tubing Drawn from Round Tubing
B65-10236	Burst Diaphragm Protects Vacuum Vessel From Internal Pressure Transients
B65-10241	Shock Absorber Operates Over Wide Range
B65-10244	Lightweight Coaxial Cable Connector Reduces Signal Loss
B65-10245	Captive Nut Fastener Securely Joins Brittle Materials
B65-10246	Thermocouple-to-Instrumentation Connector Features Quick Assembly
B65-10248	System Transmits Mechanical Vibration into Hazardous Environment
B65-10251	Control of Component Differential Hardness Increases Bearing Life
B65-10254	Remotely Operated Clamping Tool Has Positive Grip
B65-10256	Hollow Plastic Hoops Protect Thermocouple in Storage and Handling
B65-10261	Boron Carbide Whiskers Produced by Vapor Deposition
B65-10262	Rotating Holder Permits Accurate Grinding of Metallurgical Microsamples
B65-10265	Weld Leaks Rapidly and Safely Detected
B65-10266	One-Shot Valve May Be Remotely Actuated
B65-10279	Inflatable Bladder Provides Accurate Calibration of Pressure Switch
B65-10285	Differential Pressure Gauge Has Fast Response
B65-10291	Spiraled Channels Improve Heat Transfer Between Fluids

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B65-10300	Impurity Diffusion Process for Silicon Semiconductors is Fast and Precise
B65-10301	Remote Rapidly Varying Pressures Accurately Measured
B65-10312	Air Brake-Dynamometer Accurately Measures Torque
B65-10319	Refractory Metals Welded or Brazed with Tungsten Inert Gas Equipment
B65-10323	Volumetric System Calibrates Meters for Large Flow Rates
B65-10326	Rough Surface Improves Stability of Air-Sounding Balloons
B65-10327	Pressure Responsive Seal Handles Static and Dynamic Loads
B65-10331	Closed Fluid System Without Moving Parts Controls Temperature
B65-10338	Inert-Gas Welding and Brazing Enclosure Fabricated from Sheet Plastic
B65-10339	Disk Calculator Indicates Legible Lettering Size for Slide Projection
B65-10341	Lightweight Hinged Bellows Restraint Has High Load Capacity
B65-10342	Electromagnetic Hammer Removes Weld Distortions from Aluminum Tanks
B65-10346	Improved Poppet Valve Provides Positive Damageproof Seal
B65-10348	Standoff Tool Speeds Placement of Friction-Fit Electrical Terminals
B65-10351	Hydraulic Drive System Prevents Backlash
B65-10358	Fastener Distributes Stress Evenly from Sandwich-Panel-Hung Items
B65-10360	Portable Tool Removes Burrs from Pipe and Tubing
B65-10366	Unique Gear Design Provides Self-Lubrication
B65-10367	Flexible Plastic Ring Assembly Makes Durable Shaft Seal
B65-10369	Respiratory Transfer Valve Has Fail-Safe Feature
B65-10370	Brazing Method Produces Solid-Solution Bond Between Refractory Metals
B65-10371	Universal Bellows Joint Restraint Permits Angular and Offset Movement
B65-10374	Plastic Plus Stainless-Steel Fibers Make Resilient, Impermeable Material
B65-10375	Portable Tool Cleans Pipes and Tubing
B65-10377	Binary Counter Uses Fluid Logic Elements
B65-10378	Reinforcement Core Facilitates O-Ring Installation
B65-10383	Threaded Split Ring Connector Separates Structural Sections
B65-10385	Rack Mount Device Quickly Inserts or Extracts Chassis Units
B65-10386	Drill Bit Design Assures Clean Holes in Laminated Materials
B65-10387	Shrinkable Sleeve Eliminates Shielding Gap in RF Cable
B65-10388	Strainer Fits Inside Flared-Tube Fittings
B65-10389	Insulator-Holder Protects Transistors in Dense Electronic Assemblies
B65-10390	Test Strips Detect Different CO_2 Concentrations in Closed Compartments
B65-10391	Tungsten Wire and Tubing Joined by Nickel Brazing
B65-10392	Noncontracting Vibration Transducer Has Constant Sensitivity
B65-10393	Die and Telescoping Punch Form Convolutions in Thin Diaphragm
B65-10394	Centrifugal Device Separates Liquid From Gas
B65-10395	Optical Output Enhances Flowmeter Accuracy
B65-10396	Adhesive-Backed Terminal Board Eliminates Mounting Screws
B65-10397	New Brazing Alloy Eliminates Metal-Stress Cracking
B65-10398	Nickel/Tin Coating Protects Threaded Fasteners in Corrosive Environment
B65-10399	Binary Counter Accumulates Time by Complementary Preset
B65-10400	Electrically Heated Diaphragm Eliminates Use of Pyrotechnics
B65-10401	Photosensors Used to Maintain Welding Electrode-to-Joint Alignment
B65-10402	Lightweight Door Seals Cryogenic Container Against Diaphragm Type Loading

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